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Becoming a teacher in rural areas: How curriculum influences government-contracted pre-service physics teachers' motivation

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ABSTRACT

Using a retrospective cohort approach, this study examined how explicit and hidden curriculum impact government-contracted pre-service physics teachers' motivation to work in rural schools. We found that the rural teacher motivation includes two layers: "to be a teacher" and "to be a teacher in rural areas." Most participants lacked an intrinsic motivation when entering the program, thus experiencing a motivation reshaping process. The explicit curriculum created imbalance but eventually enhanced their self-efficacy and was helpful for them to be aware of the value of serving rural communities. The hidden curriculum such as college teachers, social information and government contract suggested the pre-service teachers contemplate their motivation, better understand their career choices, and increase their value of the social utility of teaching.

1. Introduction

It is a common phenomenon throughout the world that rural schools have difficulty recruiting qualified teachers due to financial, geographic, living, and emotional conditions (Cochran-Smith, Davis, & Fries, 2004; Collins, 1999; Ingersoll, Merrill, & Stuckey, 2014; Tang, He, Liu, & Li, 2018). Studies showed that pre-service teachers have low motivation to work in rural communities (Boyd, Lankford, Loeb, & Wyckoff, 2005; Cuervo & Acquaro, 2018; Janzen & Cranston, 2016; Kline, White, & Lock, 2013; McEwan, 1999), and that the teacher turnover rate is higher in rural schools. For example, a study by Kline et al. (2013) reported that no more than 30% of teacher education graduates tend to work in rural areas, and up to 80% of teachers recruited in rural areas quit the teaching profession within three years (Heilig & Jez, 2010).

Diverse programs were designed to improve the supply of teachers to rural schools (Liao & Yuan, 2017). The most widely adopted strategy is financial incentives such as wage premiums, bonuses, housing stipends, and free participation in special professional development programs. However, this strategy has proved to be effective only for teachers who lived in disadvantaged conditions such as social isolation or poverty (McEwan, 1999). In comparison, the "Alternative route" appears to be a more effective strategy to motivate teachers in many countries (Mpokosa, Ndaruhutse, McBride, Nock, & Penson, 2008). This approach lowers the entrance requirements (e.g., pre-service training, education, experience, certification) to hire teachers in rural areas and motivates more individuals to enter the teaching system in these areas. However, the strategy has been criticized for the lack of sufficient professional training on the part of the program participants (Chudgar, Chandra, & Razzaque, 2014). To deal with these disadvantages, many countries have launched long-term pre-service professional development programs to help teachers internalize a robust intrinsic

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motivation. For example, Australia launched a project—National Exceptional Teachers for Disadvantaged Schools (NETDS) to motivate top-university graduates to work in low socioeconomic status (SES) schools. After an 18-month theoretical and practicum training, more of these participating student teachers were willing to select lower SES schools as a first career path—the percentage raised from 35.3% (2007–2010) prior to the program to 87.9% (2011–2015) after implementation (Burnett, 2017; Lampert, Burnett, & Davie, 2012). However, how long these new teachers will stay in rural areas remains unknown. They are free to quit the job after working there even for only a few months due to dissatisfaction, working stress, or other reasons (Skaalvik & Skaalvik, 2011). In short, teacher motivation to work in rural schools remains a severe challenge to policymakers.

Aware of the limitations of the strategies mentioned above, the Chinese government launched a Government-contracted Pre-service Teacher program (GPT program, also known as Free Teacher Education program) to motivate student teachers to work in rural schools (China's Ministry of Education, 2011; China's Ministry of Education, 2007). The program relies on a compel contract and dramatically increases the number of rural teachers (Yuan & Zhang, 2017). The current study focuses on the formation of the physics student teachers' career motivation. I examined how the curricula of the GPT program impacted the physics student teachers' motivation regarding being a rural physics teacher. Using a cohort study approach (Cohen, Manion, & Morrison, 2007), I collected multiple data sources from six cohorts of teachers (n = 121) who attended this program. The study answers the following questions:

1) How did the student teachers' motivation to be a rural physics teacher change throughout the course of the curriculum-based learning?
2) How did the curricula impact the student teachers' motivation to be a rural physics teacher?

2. Theoretical perspective

2.1. Rural teacher motivation

Prior studies indicate that rural teachers' career motivation is a more complicated construct than that of the general teachers' (Handal, Watson, Petocz, & Maher, 2018; Rots, Kelchtermans, & Aelterman, 2012). For most cases, the rural teachers have to answer not only the usual question, "why I select teaching as a profession," but also "why I choose to be a teacher in a rural area." To answer the two questions, they bring in concerns about the value and expectancy both for working as a teacher and for working in the rural schools. Concerning this complexity, studies need to differentiate teachers' motivation toward the profession and toward a specific socioeconomic setting (Knoblauch & Chase, 2015; Lampert & Burnett, 2011). Yuan and Zhang (2017) suggest situating rural teachers' motivation in an institutional and sociocultural environment by linking it to teachers' self-efficacy, outcome expectation, professional autonomy, and social support. They explicitly refer to professional autonomy and social support to indicate that rural teachers' motivation is primarily based on their interaction with the sociocultural environment, which is a source for them to understand the social obligations and values of being a rural teacher (Watt & Richardson, 2008).

In the current study, I adopted the above two-layer motivation point for the rural teacher motivation. To possess a strong motivation to the profession, student teachers need intrinsic stimuli (e.g., higher self-efficacy), as well as external stimuli (e.g., financial benefit); however, "to be a rural teacher" requires more than "to be a teacher." Student teachers need altruistic stimuli to serve the society, especially in under-developed areas, to be willing to work in rural areas. The latter is more challenging because, as Clark (2017) indicates, rurality (e.g., contexts, cultures, social aspects) adds unique challenges for (Bostic, Vostal, & Ruffer, 2014; Burton, Brown, & Johnson, 2013) and influences on teachers in the rural context (Hawley & Crowe, 2016; Martin, Rutherford, & Stauffer, 2013; Wright & Wilson, 2009).

2.2. Two kinds of curricula

College-level curricula should promote students' motivation to select a career that will be a valuable life-long choice; yet, in many cases, curricula do not address this aspect (Hafferty & Castellani, 2009). Curricula seldom explicitly aim to leverage students' career motivation (Fields, 2004). Instead, they are more often designed toward conveying specific substantive knowledge, and it is assumed that by learning the knowledge and being exposed in the schooling setting, students will be motivated spontaneously toward one particular career orientation. However, little is known about whether and how such knowledge impacts students' career motivation (Roness & Smith, 2010).

By analyzing student teachers' experience in school, this study recognizes two types of curricula that might impact their career motivation. The most prominent is the explicit curriculum, which includes the so-called formal curriculum and the informal curriculum (Lopes & Pereira, 2012): The formal curriculum, including the syllabuses, textbooks or learning guides, predefines aspects such as the learning objective, the content knowledge, and practicum. The informal curriculum, also toward knowledge construction, is that not being planned but happens in the teaching and learning process, including such aspects as students' practice (e.g., drawing, calculation) on the handouts or student notes. In the GPT program, the explicit curriculum aims to prepare student teachers with the substantive knowledge, learning theory, teaching skills, and strategy, as well as hands-on practicum, and thus helping them form a foundation for their future profession. This foundation might impact student teachers' perceived capability or efficiency and thus might influence their motivation to be a rural teacher in the future as suggested by prior studies (i.e., Watt & Richardson, 2008; Malmberg, 2008; Martin et al., 2013).

While acknowledging the importance of the explicit curriculum above mentioned, I argue that the hidden curriculum (Anderson, 1992; Bain, 1990; Cornbleth, 1984) is another significant part of school learning and one that is vital in helping GPTs formulate their

motivation toward future professions (Hafferty & Castellani, 2009; Phillips & Clarke, 2012). Anderson (1992) depicted it as the most vital aspect of the curriculum: “It is the essence, the soul, that which is remembered after the source is forgotten” (p. 21). The hidden curriculum dominates a non-deliberately designed learning experience, which could refer to the learning climate, an informal conversation, the relationship between teachers and students, the social information conveyed in the classroom, a specific rule, or the culture merger between different student backgrounds. In the GPT program, the hidden curriculum transmits information that is necessary for student teachers to know more about the relations between the social context and their prospective careers (Ginsburg & Clift, 1990). For example, college teachers occasionally mention that their prior students (i.e., current rural teachers) are helping students in rural schools through informal communication. Either positive or negative information from such conversations might provide a social context that potentially influences the students’ motivation toward prospective rural careers. The hidden curriculum can help students better understand the value of a future career choice regarding responsibility, social and gender equity, cultural diversity, and democratic participation (Christidou, 2011). I argue that this function is especially helpful for the participants in our study to realize the value of working in rural schools. Further, it helps to shape student teachers’ motivation toward a career orientation of rural teaching.

2.3. Student teachers’ career motivation change: A four-stage model

Prior studies proposed different theories to explain how teacher motivation is changed and shaped over time. Based on Elliot (1999), Butler and Shibaz (2008) and Malmberg (2008) developed achievement goal theories independently, both of which suggest that student teachers’ motivation depends on the goals of learning in the curriculum and on what they want to achieve. Richardson and Watt (2006) proposed an expectancy-value perspective. They regard the socialization influence (e.g., social dissuasion) as an antecedent in teacher motivation. At a more proximal level, they propose task perception (e.g., demand and return), self-ability perception, and values (e.g., intrinsic value, personal utility value, and social utility value) as the principal components that account for shaping and changing teacher motivation. These components highlight the importance of teachers’ perceptions of both the profession’s requirements and the social needs. All of these aspects align with our research aim. Therefore, the current study adopted Richardson and Watt’s perspective.

Compared to the substantive studies regarding explanations of teacher motivation, fewer studies investigate how curricula play a role in teachers’ cognitive process of motivation change (Han & Yin, 2016). Kubanyiova (2009) argued that teacher motivation change is a process from actual teacher self to ideal teacher self and recognized professional learning as effective in promoting this cognitive change process. To uncover the complexity of the cognitive change, I adapted a four-stage model of motivation change toward career choices (Fields, 2004)—contemplation, imbalance or ambivalence, evaluation, and adjustment (Fig. 1). By using this adapted model, student teachers' curriculum-based education was regarded as a holistic process that contributes to shaping and changing their motivation. Contemplation is a stage during which students begin to perceive their motivation to a future career intentionally, including awareness of the value (i.e., intrinsic, personal utility, and social utility) of choice, demand, and return of the profession, and the influence of the selection on life. This stage gains attention because in many cases, students make a decision passively by social dissuasion and are not aware of why they should make that choice (Richardson & Watt, 2006). However, when being triggered by factors such as an informal conversation with teachers (i.e., hidden curriculum) or a planned lecture (i.e., explicit curriculum), they might begin to concentrate more consciously on their decision.

A triggered factor from curriculum-based learning does not necessarily change student teachers’ motivation, but can, if it involves an imbalance or ambivalence of perception or value, potentially lead student teachers to either increase or decrease motivation (Fields, 2004). Rogers and Mewborn (1976) stated that self-efficacy (i.e., self-ability perception) and the presence of perceived risk are the significant sources formulating imbalance or ambivalence. Self-efficacy is usually interpreted as perceived capability or self-evaluation toward outcome expectation (Velthuis, Fisser, & Pieters, 2014), whereas perceived risk denotes the pressure that challenges the student teachers’ health, feelings, or social status. Both sources are influenced by the curriculum that student teachers take and functioning simultaneously. For example, in a typical situation when lower-performing student teachers feel a sense of achievement from applying the teaching in classrooms effectively (i.e., task perception) according to the feedback from practicum

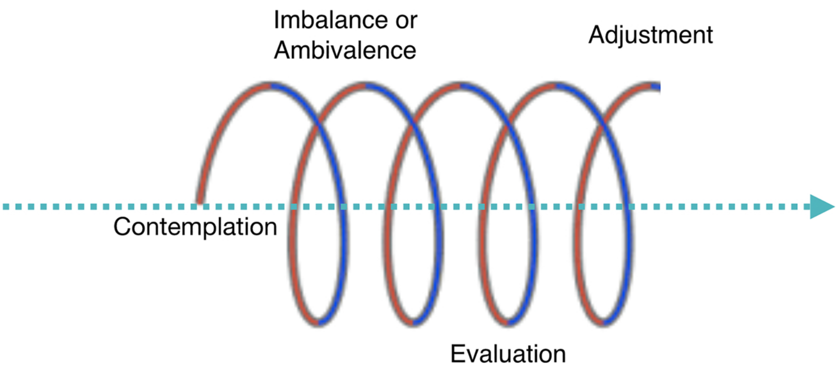

Fig. 1. A model of career motivation change.

courses (i.e., explicit curriculum), they will move toward a higher perceived capability. Accordingly, they might increase their career motivation. In contrast, when student teachers communicate with junior peers (i.e., hidden curriculum) and are aware of the financial disadvantages (e.g., lower stipend) of being a teacher in a rural area compared to an urban area (i.e., task perception—return), they might perceive a risk to their prospective social status.

Though both explicit and hidden curriculum provide triggering factors toward student teachers' motivation, there is not a standard that says which factor is more critical than others. The actual result depends on how much these triggering factors change student teachers' value (Bastick, 2000; Moran, Kilpatrick, Abbott, Dallat, & McClune, 2001; Watt & Richardson, 2008). Therefore, student teachers need to perform an evaluation when multiple triggering factors co-occur. This evaluation is usually a struggle for them but is critical to determine their prospective careers (Sinclair, 2008).

Such an evaluation usually results in an adjustment of student teachers' motivation, either an increase or a decrease. This adjustment is different from a determination as it is usually unconscious. Student teachers do not have to confirm or disconfirm their adjustment intentionally. However, it might influence student teachers' behaviour dramatically (Glynn, Taasoobshirazi, & Brickman, 2007).

3. The Government-contracted Pre-service Teacher program in China

In 2007, the Chinese government launched the GPT program to involve pre-service teachers in rural schools by signing a contract. The GPT is a curriculum-based program. Six top normal universities in China host this program and provide teacher education through curricula including subject-matter courses, teaching and learning courses, and practica. The Ministry of Education selects high-performance secondary graduates from rural areas for this program. To encourage top-performing students to attend the program, the government waives tuition fees and provides free accommodations, promise of a career position, and a monthly stipend for each student (approximately ￥9 000 Chinese Yuan (CNY) per year (Liao & Yuan, 2017)). In return, the students agree to a contract with the government promising to come back to their hometown and work for ten years with at least the first two years in rural schools. If they fail to fulfill the obligations, the students have to compensate the total cost of the program, pay a hefty penalty, and receive a bad credit record (China's Ministry of Education, 2011; China's Ministry of Education, 2007). This mandated policy was being critiqued as a "carrot" and "stick" policy, which constrains both student teachers' pre-service life and the first ten years of their career life for a total of up to 14 years, and thus has a significant influence on individuals. Even in 2007—the first year the policy launched—there were 10 737 students registered in this program, with annual increases continuing (Yuan & Zhang, 2017). At the time that the current study commenced, there had been seven cohorts of pre-service teachers entering their contracted careers after the 4-year training. Different from the NETDS program in Australia, the Chinese policy yields a lower teacher turnover rate due to the compel contract.

Several studies have explored student teachers' motivation in the GPT program in the subject of English with a minimal sample size (Wang & Gao, 2013; Yuan & Zhang, 2017), but no study focuses on the motivation of science student teachers. Since physics teachers' motivation is especially difficult to shape and maintain (Borman & Dowling, 2008), as evidenced by a study that found twice the turnover rate compared to teachers in other subjects (Stinebrickner, 1998), this study focused on a larger number of participants majoring in physics education. Drawing upon the critical objective of the GPT program that is to promote students' value and responsibility to serve the rural society through curriculum-based learning, the study aims to understand how the curriculum impacts the pre-service physics teachers' motivation change toward being a rural teacher. To achieve this aim, I first focused on understanding how their motivation changed through the program and then surveyed how the four-year curricula influenced these changes. Because what attracts someone deciding to enter a teaching program (prior consideration) is especially important to understanding their motivation formulation (Sinclair, 2008; Williams & Burden, 1997), I also surveyed the reasons that motivated the student teachers to enter the program.

4. Methods

4.1. Participants

Using the cohort study approach with retrospective data (Cohen et al., 2007), I recruited 121 in-service physics teachers who had already graduated from the GPT program. The teachers' registry years ranged from 2007 to 2013 distributed in six cohorts, as a **general group** (n = 121; see Table 1). Data from this general group was used to answer the first research question. To answer the second question, I primarily focused on two cohorts of in-service physics teachers (registered in 2010 and 2011), **a focus group** (n = 38), because these teachers were attending a master's degree program when the study conducted so I was able to collect multiple data face-to-face (e.g., interview).

4.2. Curriculum-based training

Settling in a more extensive project, in which I purposely explore how the GPT program influences in-service teachers' motivation, the current study only focused on the period during which teachers were learning in the GPT program. During the 4-year program, the participants, as government-sponsored student teachers, received the curriculum-based training in four components: *Physics subject-matter courses (76.5 credit)*, *general teacher education courses (61.1 credit)*, *physics education courses (19 credit)*, and a three-

Table 1
Sample information.

Registry year	Graduation Year	# of Sample	Gender (M/F)	Working experience
2007	2011	33	19/14	6
2009	2013	13	5/8	4
2010	2014	5	3/2	3
2011	2015	33	17/16	2
2012	2016	24	11/13	1
2013	2017	13	6/7	0

Table 2
The courses in the GPT program for physics student teachers.

Stage	Courses	Description
I	Physics subject-matter courses	The courses include basic physics (including experimental practices and mathematics) and advanced physics in which students learn a broad range of physics knowledge such as mechanics, optics, electrics, electromagnetics, and quantum mechanics. These courses are arranged mainly in the first two years, and physicists teach a majority of these courses.
II	General teacher education courses	The courses include two strands: the first provides general pedagogical knowledge on such aspects as curriculum theory, instruction theory, educational management, and educational psychology. The second strand includes knowledge and practice about general professional development such as undergraduate language courses. According to our pilot interview, students in this study did not regard the latter strand as influencing their motivation to teach physics, so we only included the first strand in the current research. These courses are arranged mainly in the first semester of the third year, and most of the teachers who teach the first strand courses are from the department of education.
III	Physics education courses	The courses are about physics teaching pedagogy and psychology, in which students learn knowledge about the curriculum and instruction for middle school teaching. The professors who teach these courses are experts in physics education or come from the physics department with a physics background. Students learn most of these courses in the second semester of the third year.
IV	Teaching practicum	In the first semester of the final year, students attend a three-month teaching practicum in a field school where they have an opportunity to observe teaching, attend seminars, mentor students, and conduct formal instruction.

month *teaching practicum (10 credit)*.[1] These courses highlight the integration between (1) theoretical learning and practices; (2) content knowledge and pedagogy knowledge; (3) general teacher education and disciplinary teacher education. Despite of minor overlaps, different kinds of courses were arranged that divided the program into four stages (Table 2).

4.3. Instruments

4.3.1. Retrospective survey for motivation

I developed, piloted, and revised a motivation survey with the help of two GPTs. The survey is retrospective and self-reported, including four parts (see Appendix A). First three are surveys of the student teachers' motivation to attend the GPT program, to be a physic teacher, and to be working in rural schools before entering the GPT program. These parts allow students to select options from multiple-choice items, to write down their own answers or to select options from a five-point scale. The last part asks students to indicate, using a five-point scale (1 = strongly don't want and 5 = strongly want), the perceived magnitude of their motivation to be rural physics teachers when entering the university and after attending the four kinds of courses and practicum. Cronbach's coefficient was .84 (item n = 5), which indicates high reliability.

4.3.2. Self-narrative report

To further understand how the four stages of courses and practicum influenced the GPTs' motivation, I asked them to recall and write down narratives of a scenario, a teacher, or a period of class that had affected their motivation to be a rural teacher at each stage of the curriculum-based learning.

4.3.3. Group interview

After reviewing the results of the motivation survey and the self-narrative reports, the researcher organized a group interview (Rabiee, 2004) with the 38 participants in the focus group. The conversation took place in a large classroom and lasted 54 min. The researcher raised some general questions corresponding to their responses to the surveys and the self-narrative reports but set no limitations on the discussion topic. For example, the researcher asked: "Why did some students at a higher motivation when entering

[1] The credits presented were from a randomly sampled participant's record. To be noted, there is minor differences across students due to optional courses.

the program decreased their motivation to be a rural teacher at the stage of *Physics subject-matter courses* learning?" Students could talk about whatever they thought and experienced. This interview served as a supplemental source for the self-narrative reports to provide deeper insight into the second research question.

4.3.4. Individual interview

Though the GPTs provided detailed information about why and how their motivation changed under the curriculum-based learning, most of the information obtained was fragmented. I did not know an individual's background information, his or her characteristics and so forth, without which I would be unable to validate the findings. Therefore, I selected seven GPTs and conducted a semi-structured individual interview with each. The interviewees were selected based on two criteria: (1) diversity of background (e.g., geography distribution, gender, motivation types); (2) willing to express their own ideas (according to their answers to the survey and the self-narrative reports). The questions were intended to explore more background information and the holistic motivation-shifting process from the time of entering to graduation. Each interview lasted from 30 to 60 min.

4.4. Data collection

This study was limited by the retrospective data. Even though "cohort studies with retrospective samples of population are uniquely able to identify typical patterns of development and reveal factors operating on those samples" (Cohen et al., 2007 p. 216), I thought a need to decrease the memorization fade effect. I employed a retrospective promotion approach for the focus group: First, I developed a protocol (see Appendix B) and used it to organize a classroom-level reflection about how the GPT program contributed to their current teaching. I hope this step helps the teachers recall more details about how the curriculum-based learning impacted their motivation to be rural physics teachers. Second, I deliberately asked GPTs to first complete the self-narrative report and then complete the motivation survey. I assume that the self-narrative report practice would help them get a better recalling of the career motivation during the four types of courses learning or practicum. Besides the data from the focus group, I collected the survey and narrative data using an online survey tool from the other four cohorts (n = 83).

4.5. Data analysis

To depict student teachers' motivation shift, I averaged the **general-group** student teachers' score on the five-point scale survey at each time point and calculated the standard deviation to get the trend of student teachers' motivation shift. In order to examine the effectiveness of the curriculum-based learning, a repeated measures ANOVA was employed to compare the motivations between the consecutive time points. I had two ways to triangulate the above finding: First, I calculated the above measures for the **focus group** to validate the trend of the motivation shift and the effect of the curriculum-based learning because I believe the retrospective promption approach helped student teachers in the focus group better recalling their perceptions. Second, I dug into the multiple qualitative data of the **focus group** to triangulate the motivation changes and to further explore the reason. Following I introduced how I analyzed the qualitative data.

I employed a theory-driven data analysis approach (Cohen et al., 2007). Using the motivation change model, I generated four sets of codes (i.e., features of change, sources for change, motivation types, and trend of change) for each of the four stages (see Table 3).

Table 3
The codes for the four-stage model.

Type of codes	Contemplation	Imbalance/ ambivalence	Evaluation	Adjustment
Features of change	- New information emergent - Intentionally noticing the meaning of the future career choice (e.g., intrinsic value, personal utility, or social utility) - Comparing the career with other career choices - Reflection the career choice	- New career interest developed - Realizing risks - Hesitated in adjusting the career choices - Constrains emergence	- Multiple trigger factors emergent - Evaluating the advantage or disadvantage (e.g., social utility, return) - Self-efficacy changed - Outcome expectation changed	- Recognizing a change in motivation - Self-identity as a rural teacher improved
Sources for change	- Knowledge or practicing from explicate courses - Arrangement of the courses (e.g., difficulty) - Knowledge or information from social interaction with teachers or peers - Relationship between teachers and students - Special rules or constrains - Model effect (e.g., teachers as a career model) - Encouragement or discouragement information			
Motivation types	- Intrinsic - Extrinsic - Altruistic			
Trend of change	- Positive - Uncertain - Negative			

The codes of *features of change* are specified for each stage of the motivation change model, while the other three sets of codes are general for all four stages. I reviewed all the qualitative data, segmented the different data sources, and categorized them into four groups according to the four learning stages (i.e., *Physics subject-matter courses*, *general teacher education courses*, *physics education courses*, and a three-month *teaching practicum*). I then assigned the codes by the group and by the participant. Specifically, I assigned the *features of change* and *sources of change* to different data sources; and assigned one *motivation type* code and one *trend of change* code to each learning stage. To ensure the validity and reliability, another middle school teacher reviewed the codes. We solved the discrepancy (6%) by discussion. We then discussed the motivation trajectory of each participant in the focus group and came out a profile for each. For example, the profile for student teacher 24,

> Student teacher 24 selected the GPT program because the program is free tuition and his decision was primarily influenced by parents, relatives, and friends. In the first learning stage, he attended some research projects in a professor's lab and became very interested in research. He could not recall a scenario that increased his motivation to be a rural teacher. Instead, he eagerly wanted to be a scientist. However, after being aware of some constraints of the GPT through communication with peers, he had no choice but pushed himself to follow the program contract. Fortunately, he found that being a teacher is interesting through the general teacher education courses. He mentioned some courses with teaching examples triggered his interest in teaching. He also found that the physics education courses were very useful to increase his ability and skills in teaching physics. However, he acknowledged the courses were limited in duration. He realized teaching was a very interesting and valuable job when practicing in a middle school during the practicum. He also mentioned that the interaction with low SES students helped him to realize the extra value of teaching in rural schools.

We then made a cross-case comparison in order to shed light on the reasons how both explicit and hidden curriculum impacted student teachers' motivation. This comparison was conducted by the author and the middle school teacher till we all agreed with the findings.

5. Findings

5.1. Student teachers' motivation change

I noted that the GPTs' motivation decreased substantially in the first stage of learning ($p < .001$ level) and gradually increased in the following stages. In the final stage—teaching practicum—their motivation ($M = 3.31$, $SD = 1.19$) significantly exceeded that before the formal curriculum learning ($M = 2.74$, $SD = 1.24$) at $p < .001$ level, which indicates that the curriculum-based learning had a comprehensive positive effect on GPTs' motivation (Fig. 2). I then conducted repeated measures ANOVA with the five time points. Mauchly's test of sphericity shows that the assumption was violated, $\chi^2(9)= 42.8$, $p < .001$. Using a Greenhouse-Geisser correction, I found significant within-subject difference across the five time points ($F(3.38, 405.17) = 22.66$, $p < .001$, $\eta_p^2 = .159$). LSD post hoc test shows that student teachers' motivation between consecutive time points is all significantly different at $p < .05$ level (see Table 4). This result indicates that each stage of curriculum-based learning had a significant effect on student teachers' motivation change.

5.2. Curriculum-based learning impacts student teachers' motivation

In order to understand how the curricula impacted student teachers' career motivation, in this part I reported the findings from the focus group by learning stages. The student teachers in the focus group came from two cohorts and had experienced the in-person retrospective promotion session. These teachers represented well the general group as evidenced by the followings: First, Fig. 2 shows an identical trend of focus-group motivation shift as that of the general group . Second, according to a repeated measures ANOVA (Mauchly's test of sphericity shows that the assumption was met, $\chi^2(9)= 15.3$, $p > .05$), I also found significant within-group difference across the five time points ($F(4, 148) = 13.27$, $p < .001$, $\eta_p^2 = .264$). More importantly, LSD post hoc test also shows that

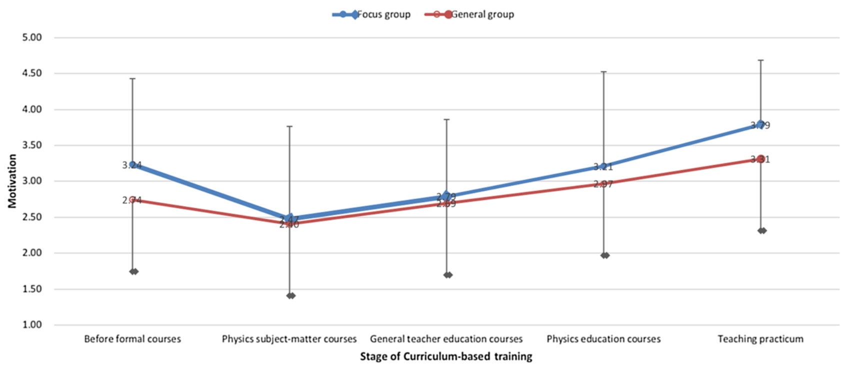

Fig. 2. Teacher motivation change across the GPT program.

Table 4
Student teachers' motivation change by repeated measures ANOVAs.

Group	Time point (I)	Mean (SD)	Difference (M_{I+1}-M_I)	*p*	Cohen's d_{rm}
General group (n = 121)					
	1	2.74 (1.24)	−.34	.001	.28
	2	2.41 (1.10)	.29	.003	.25
	3	2.69 (1.15)	.27	.000	.24
	4	2.97 (1.14)	.35	.000	.29
	5	3.31 (1.19)	.57*	.000*	.47*
Focus group (n = 38)					
	1	3.24 (1.20)	−.76	.001	.62
	2	2.47 (1.29)	.32	.026	.25
	3	2.79 (1.32)	.42	.009	.34
	4	3.21 (1.14)	.58	.010	.52
	5	3.79 (1.07)	.55*	.029*	.48*

Note. Time point (I): 1 = Before formal courses, 2 = Physics subject-matter courses, 3 = General teacher education courses, 4 = Physics education courses, 5 = Teaching practicum.
* indicates the difference between timepoint 5 and 1.

student teachers' motivation between consecutive time points is all significantly different at $p < .05$ level (see Table 4). The above analysis not only suggests that the homogeneity between the focus and general group, but also triangulates motivation change I found from the general group, concerning that the focus group experienced a retrospective promotion.

5.2.1. *Enter the GPT program: Passive choice*

The survey indicates that 60.53% of the student teachers entered this program due to no more than one factor (e.g., social dissuasion, financial concern, or career advantage). Of the 38 responses, only 26.3% entered the program reported intrinsic motivation, and most of those who selected the GPT program indicated an extrinsic motivation (81.6%), which is consistent with prior studies (e.g., Ejieh, 2005). I did not find altruistic motivation, which means they had a hard time to realize the social value and obligation of working in rural schools when entering the program (Data for this part refers to Appendix C).

5.2.2. *Physics subject-matter courses: A reality shock*

The considerable decrease of motivation from $M = 3.79$ ($SD = 0.90$) to $M = 2.47$ ($SD = 1.29$) in the first stage of learning drew my attention. By analysis of student interviews and self-narrative data, I identified three reasons for this drop . First, a broad range of career interests (e.g., to be a physicist or an engineer, or to pursue a higher degree of education) besides teaching were stirred up by social interactions with teachers and peers as well as learning, thus distracting the GPTs' motivation. Almost half of the GPTs entered university without strong interest in teaching in rural schools due to their limited professional knowledge. The university life opened their eyes to more opportunities for future careers, and they realized the disadvantage of being working in rural areas (e.g., shopping inconvenience, being difficult to find spouse/partner), thus further decreasing their interest. Like other regular students, they began to formulate plans other than being rural teachers for their future.

> Through taking physics courses such as quantum mechanics, solid physics, I knew doing physics research is fantabulous. I even had an opportunity to research in a professor's lab. That experience motivated me to rethink my future. Maybe, a physics teacher in a rural school was not the optimal choice. (Student 20)

The program provides GPTs with physics subject-matter courses and the opportunity to engage in physics research, which is a primary source intended to advance their subject-matter knowledge for teaching. However, the courses extend their interest and formulate various career plans. These initial plans distract their motivation to be rural physics teachers.

Second, they reported that the arrangement of courses influenced their outcome expectation and self-efficiency. At the beginning of the program, they did not have a complete picture, so they did not completely understand the purpose of the arrangement. Some students reported that they felt disappointed with the content of the basic physics courses, especially in the first semester (though they admitted a misunderstanding after knowing about the whole picture). For example, some students mentioned the *advanced mathematics* course, which needs basic physics learning to allow for a comprehensive understanding of this course. "That doesn't make sense for middle school physics in my mind; I could not understand why we had to learn such courses at that time. It's a waste of time" said Student 29. This sort of thinking influenced some GPTs' motivation for learning. Gradually they found it challenging to learn advanced physics without first taking basics physics courses. This drop in self-efficacy resulted in lower motivation to be a rural teacher.

Last, some students reported that how the teacher taught physics influenced their motivation. As Student 28 stated, "the teaching style was different between high school teachers and university teachers; therefore, I felt it was difficult to catch on in these courses." Maybe because most of the university teachers mainly concerned with research rather than teaching, they did not pay much attention to teaching pedagogy. This "new" teaching style decreased GPTs' self-efficacy.

> In one mechanics course, the teacher overrated our learning proficiency. As a result, most of us could not catch the content. We

have to spend much more extra time to remediate the classroom learning. This course decreased my confidence. (Student 21)

Even though I sought to account for GPTs' motivation decrease in the *physics course* stage, our samples also reported a few positive effects on their motivation change. For example, a teacher who taught *quantum mechanics*, Professor G1, was praised by many GPTs (e.g., Students 12, 13, 14, and 16) for his high proficiency teaching and concern for students. Professor G1′s case suggests that the physics professors who engaged more in physics teaching (e.g., concerning students' academic progress) were potentially more effective in promoting the GPTs' motivation to be middle school teachers, though not necessarily in promoting them to teach in rural areas. In sum, the teachers' motivation change was most likely due to both the challenges of professional development and the disadvantages of working in rural areas.

5.2.3. General teacher education courses: A "Self-regulator"

After experiencing a significant drop in the first stage, the GPTs' motivation began to increase in the stages that follow. The second stage mainly offered general pedagogical courses, through which the GPTs' motivation increased by 0.32 point (from $M = 2.47$, $SD = 1.29$ to $M = 2.79$, $SD = 1.07$). This increase reflected that students began to self-regulate. First, some students began to accept the fact that they had no choice but to accept this "unwilling choice"—to be rural physics teachers after graduation. Soon after entering the program, they realized their differences compared to their unfunded peers. Some of them became aware of the fact that they could hardly achieve their dream like others due to the contract they made with the government.

> We had to compensate the amount up to 1.5 times of the funding and would have an adverse credit record if we tear up the contract, for example, to pursue a master's degree. That depressed both my classmates and me; we began to feel regretted and disappointed. (Student 26)

Most of the students came from rural places with limited family income; thus, the vast amount of refund was out of reach for them, and they valued their credit record. They, including their parents, could not accept the fact of graduating with a bad credit record even before they found their first job. In this sense, the students in this stage sought to dismiss their dreams and attempt to cultivate an interest in physics teaching.

A significant contribution to GPTs' self-regulation was the general teacher education courses. These courses provide the GPTs with both theoretical and practical knowledge, which helps GPTs view the career of a rural teacher through the lens of a teacher. It is a different lens from that of a student's, which changed their in-depth impression profile of rural teachers. For example, Student 10 depicted a scenario in a psychology class,

> Professor L who was a famous educational psychologist gave a word that impressed me till now. He stated, "I am getting older, but my youth continues as a teacher because I am living with my students." This word is a heart quake to me, from which I knew the first time to be a (rural) teacher has such fantastic function.

Student 14 stated,

> The education course brought new knowledge for me to understand teachers: Initially, I thought to be able to teach in classrooms was sufficient as a teacher. However, [after taking these courses] I realized there are so many theories and so much meaning underlying teaching. That's interesting. This made me not to refuse to be a teacher. I began to accept a rural teacher as my future career.

Students reported not all the courses, but those that can provide more connections with classroom practice made more sense to them. For example, many students reported an excellent teacher—Professor Q, who taught General Education and promoted their motivation.

> In Professor Q's classroom, he provided us with many vivid examples of classroom education. We were promoted by these examples to rethink education from a social, progressive lens. I began to realize how superficial my initial understanding of teachers was and thus began to plan how to be a qualified (rural) teacher in the future. (Student 16)

Professor Q was an elementary school teacher for many years before coming to the university. His background experience in elementary school education helped him understand what the GPTs needed.

Though the university provided no specific courses designed to help the GPTs to accommodate the fact—working in rural schools, the student teachers learn professional knowledge and discovered positive aspects of being a middle school physics teacher. Accepting being a physics teacher became the first step for them to accept a rural teacher career.

5.2.4. Physics education courses: "Find myself"

GPTs' motivation increased by 0.42 point from the second stage ($M = 2.79$, $SD = 1.07$) to the third stage ($M = 3.21$, $SD = 1.32$). This increase was great enough to indicate that the GPTs were getting "on track" through the third stage, though no course was found to support the student teachers in their future "work in rural schools" either. Our data suggests learning at this stage further enhanced student teachers' motivation to be physics teachers (not necessary to be in rural schools), and two reasons account for the getting "on track." First, the *physics education courses* refined the GPTs' understanding of physics education. The teachers who taught the *physics education courses* had a merged background in both physics and education. Their teaching directly focused on the practical aspects of physics teaching. By learning the materials these teachers provided, the GPTs were led to rethink "what physics education is" and "how physics education makes sense" from the lens of a practitioner. This experience gave them a higher outcome expectation.

> These courses provided us an opportunity to discuss physics teaching directly and learning with peers and teachers. We began to understand that physics education is not just teaching, but also to understand students, to cooperate with them, to manage the classroom, which is, more than physics, a meaningful work. (Student 20)

Second, through the *physics education courses*, the GPTs were equipped with necessary skills in physics teaching. Though most GPTs had already received sufficient physics knowledge to teach middle school physics, and their motivation increased in the prior stage, they still did not possess direct physics teaching skills critical for self-efficacy. The *physics education courses* provide skills on how to use textbooks, how to organize classroom teaching, and how to prepare demonstrations of experiments. Only with these skills could the GPTs have an excellent outcome expectation.

> In Professor G2′s class, she involved us in group discussion, the form of which was novel to me. I had never attended that kind of discussion in middle school or high school. Through taking this course, I overcame cowardice and daring not to speak in the [public] classroom. I began to speak out my ideas, to communicate with peers and teachers about physics teaching. This led me to think about my expectation of my future career. (Student 1)

Even though the *physics education courses* were regarded as useful sources in promoting students' motivation to be physics teachers, these courses were not sufficient to meet the GPTs' need. In our interview, Student 12 made a comparison with his colleagues who attended more of these courses at another university and concluded it was useful.

> I found my colleagues who graduated from another university took more such courses than I did. They learned more classroom teaching skills such as how to control a physics classroom or how to deal with conflict in classroom discourse and were apt to perform better in their job, especially in the initial stage of their careers.

In the above two stages of learning, student teachers improved their motivation mainly through professional development. I did not find explicit resources that promoted their understanding of social utility.

5.2.5. *Teaching practicum: "Be confident with myself"*

In the last stage, the students' motivation increased by 3.79 (SD = 0.90) point. The increase was as high as 0.58, which was the greatest of the four stages. More important, the student motivation surpassed that of the GPTs entering the program by 0.55 points, which showed the program's positive effects on the GPTs' motivation. The students' narrative reports indicated three reasons for this increase. First, by engaging in teaching activities in the field school, the GPTs got social support for their professional development. The most frequently mentioned social support was from the field school teachers—the mentors of the GPTs. Many GPTs reported that these field school teachers provided them with indirect support. For example, field school teachers offered an opportunity for GPTs to observe their teaching as well as to prepare the instruction.

> My mentor, during the practicum, made many experiment instruments for teaching by himself. He enjoyed the handcrafted process and felt a sense of achievement. I experienced his joy and began to understand how fantastic physics education is! (Student 41)

On the other hand, the teachers in the field schools also personally and directly guided the GPTs' teaching.

> During the practicum, I was asked to teach *crash*. I prepared and piloted the teaching and eventually found many problems. At that time, my mentor and other colleagues offered hands to me. With their help, I completed the teaching. (Student 14)

Besides the support from the mentors, GPTs also mentioned the support from their students. For example, Student 14 also stated, "My students encouraged me as well when I felt nervous." These instances of gracious assistance helped the GPTs feel more self-effective than before.

Second, the GPTs' perception in the field school increased their motivation, when they changed from the role of student to teacher. When they performed in the field school for the first time as a teacher, they felt respected and considered. This perception amplified their motivation to be a teacher. Student 21 stated, "The students respect teachers very much in the field school. They stated 'hello teacher' to me, which gave me a sense of achievement. I suddenly found the physics teacher's life was colorful." Student 29 stated, "Through the practicum, I found [being] teachers are absolutely not bad for me. Being a teacher in my hometown (rural school), I can produce values and receive respect. That's meaningful work!"

Third, for the first time, I found altruistic motivated GPTs from their self-narrative report. The GPTs indicated that by interacting with students as a teacher, they realized their value to the social utility. After the practicum, a few GPTs mentioned that they wanted to be a rural teacher to help students grow better. For example, Student 32 stated,

> I experienced the pride and happiness through communicating with the local students. When I communicated with the poor students whose parents were migrant workers from other cities, I realized my value to them, which enhanced my motivation to be a teacher to serve the students like them in my hometown (rural schools).

6. Discussion

This study suggests that the GPTs experienced a complex career motivation change and reshaping process, during which both explicit and hidden curriculum functionally helped the GPTs adjust their motivation. Following I discussed the specific findings from the explicit and hidden curriculum perspective.

6.1. Explicit curriculum contributes to student teachers' motivation change

First, the arrangement and the difficulty of the courses created great imbalance, thus impacting student motivation. Prior studies found that science subject-matter courses positively impact science student teachers' self-efficacy (Velthuis et al., 2014), but my study found that student self-efficacy decreased when they learned the subject-matter knowledge. This low self-efficacy raised their ambivalence toward their teaching capabilities—they began questioning whether they were qualified to be a physics teacher, which further led to a decrease in motivation. I suspect that the high difficulty that students experienced in the classroom probably arose from their attending courses designed not especially for the GPTs but for the students majoring in physics. It is reasonable that if the courses were not adapted to the GPTs, it might be too difficult. My findings suggest that a redesign or adjustment of the subject-matter courses to meet the needs of the GPTs might be necessary.

Second, the courses that integrated education theory with classroom practice and teaching skills made more sense to students. Student teachers reported that the *general education courses* helped them realize that teaching was an exciting job requiring artistic skills, which refreshed students' impression of teachers (i.e., re-evaluate the career value) and leveled their outcome expectation. However, these highly efficient courses were rare, according to the GPTs' reports. The *physics education courses* offered students specific teaching knowledge and skills that enhanced their perceived capability, and thus positively motivated them to be physics teachers. However, the *physics education courses* account for only 11% of the whole curriculum; therefore, there is a great need to increase the number of these courses.

Third, the teaching practicum is especially welcomed by the GPTs. This stage offered the GPTs an opportunity to practice their previous learning and to gain self-efficacy through the role change. Specifically, they received hands-on guidance from the mentors in the field schools, which helped them to increase their perceived capability. The study also found, consistent with Kiziltepe's studies (2006), that receiving recognition from their students at the field schools is another primary factor that influences student teachers' motivation. The study found that the increase in motivation during this period was most celebrated among the four stages even though it was only three months. This finding was consistent with a prior study in which the author found student teacher motivation change was significant during the practicum (Sinclair, 2008). This finding reminds us that teacher education programs are practice-based learning and teaching practice is essential to promote student teachers' motivation.

Unfortunately, though the program aimed to train student teachers and to assign them to rural areas as physics teachers, I found no evidence that the curriculum explicitly offered courses or training regarding educational equity, cultural diversity, or even social responsibility. Although the GPTs' motivation to be physics teachers in rural areas increased, no direct evidence found that it was because of increasing awareness of educational equity or the need for educational equity for the rural students. The finding suggests the program needs more courses to address the equity issue, to help students to understand cultural diversity, and to improve social responsibility.

6.2. Hidden curriculum contributes to student teachers' motivation change

First, the college teachers serve as a major source for formulating GPTs' motivation. In a prior study, the teacher source was named as an unplanned curriculum, by which students sensed the teachers' views and attitudes both toward academia and everyday life, and thus being influenced regarding future career selection (Finson, 2002). This study suggests the teachers' teaching methods, personal experience, lifestyle and academic style, and care for students influenced both the GPTs' perceived ability and outcome expectation in both positive and negative ways. The findings indicate that teachers, especially those who teach physics subject-matter courses, need to pay more attention to their teaching methods and skills. They need to note that GPTs have different needs from those students majoring in physics. In addition, teachers need to be more aware of the need for them to care and encourage the GPTs so that they can become more aware of the value of being a physics teacher in rural areas.

Second, the study indicates that social information plays an enormous role in the formulation and shift of the motivation to be a rural teacher. Before entering the program, many of the students did not understand the constraints of the contract and the differences between being a rural physics teacher and pursuing other occupations. This lack of understanding appears to be due to a lack of knowledge regarding the various professions. However, after getting more information from peers and upperclassmen about the future of their careers after entering the program, they began to contemplate their choice. As the GPTs' awareness of other career options grew, their motivation toward the physics teaching program decreased. This finding suggests that the students need more vocational guidance before entering this program so that they can select the program actively rather than passively.

Finally, yet importantly, the contract made between the government and the students serves as a greatly hidden curriculum that plays a role in formulating the motivation to be a rural teacher. The contract accounted largely for the students' selection of the GPT program, especially the fact that, due to the attractive exterior stimulus (i.e., financial support), no altruistic motivation, which is the most critical role in determine the future career (Sharif, Hossan, & McMinn, 2014), was found. Consequently, the GPTs in the present study felt much more ambivalence about the program after they became aware of the difference between their expectations and the realities of their career choice. This realization subsequently resulted in a motivation drop, as they were now faced with fulfilling the contract or risking the financial costs associated with breaking it. That is, if the GPTs gave up the program, they would face a payback requirement and a bad credit record; both issues frustrated the GPTs and forced some to adjust their focus and accept facts. I do not intend to critique the rationality of this mandatory contract, but merely to point out that it does serve an essential role in formulating the motivation to be rural teachers, as the hidden curriculum efficiently leverages the student teachers' self-efficacy and outcome expectation.

7. Limitations and future study agenda

While find promising results that might be generalized to other pre-service rural teacher programs, I noted limitations for the study and future research topics. First, this study only collected retrospective data to explore student teachers' motivation change in a four-year program. Due to memorization fade effect, the findings might be biased. Future studies could collect longitudinal data at different time points to further validate the results. Second, in order to decrease the memorization fade effect, I deliberately organized the order of the data collections. However, I don't know whether this organization works and whether it might involve adverse effects on the validity of the study. It will be an interesting topic to study how the data collection approach impacts the validity of the retrospective study. Third, instead of using standard survey scale such as FIT-Choice Scale (Watt & Richardson, 2012), this study used a short survey to better embed the survey within the ongoing project that the participants were attending. It will be interesting to study the difference between the short survey result and the standard scale in the future studies.

8. Conclusions

This study uncovered that rural teacher motivation is a complex construct. It includes two layers: "to be a teacher" and "to be a teacher in the rural area." Most participants mainly had an extrinsic motivation rather than owning an intrinsic or altruistic motivation to be a rural teacher when entering the project. Thus, the pre-service teachers' motivation experienced a reshaping and changing process, during which not only the explicit curriculum but also the hidden curriculum significantly influenced their motivation. This influence suggests that the curriculum that intended to promote teaching profession was potentially helpful for them to be aware of the value of serving rural communities, thus advancing their motivation of being a rural teacher. I found that among the four stages of motivation change (i.e., contemplation, imbalance or ambivalence, evaluation, and adjustment), the contemplation seems critical to pre-service teachers and was being ignored by curriculum designers. The study also pointed out some weaknesses of the GPT program, such as lacking the explicit curriculum to advance pre-service teachers' value of rural communities or feelings of obligation to serving rural students. Overall, the project suggests potential factors, from the perspective of curriculum-based learning, that might impact student teachers' motivation to be a rural teacher. These factors could be generalized to other programs in different contexts (e.g., countries) to help curriculum designers and policymakers to stir student teachers' motivation to serve rural schools.

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Appendix A, B, & C

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References

Anderson, D. J. (1992). The hidden curriculum. *American Journal of Roentgenology,* (1), 21–22.

Bain, L. (1990). A critical analysis of the hidden curriculum in physical education. In D. Kirk, & R. Tinning (Eds.). *Physical education, curriculum, and culture: Critical issues in the contemporary crisis* (pp. 23–42). London, New York & Philadephia: The Falmer Press.

Bastick, T. (2000). Why teacher trainees choose the teaching profession: Comparing trainees in metropolitan and developing countries. *International Review of Education, 46*(3), 343–349.

Borman, G. D., & Dowling, N. M. (2008). Teacher attrition and retention: A meta-analytic and narrative review of the research. *Review of Educational Research, 78*(3), 409.

Bostic, J., Vostal, B., & Ruffer, B. (2014). Promoting freedom through problem-based learning. *Ohio Social Studies Review, 51*(1), 73.

Boyd, D., Lankford, H., Loeb, S., & Wyckoff, J. (2005). The draw of home: How teachers' preferences for proximity disadvantage urban schools. *Journal of Policy Analysis and Management, 24*(1), 113–132.

Butler, R., & Shibaz, L. (2008). Achievement goals for teaching as predictors of students' perceptions of instructional practices and students' help seeking and cheating. *Learning and Instruction, 18*(5), 453–467.

Burnett, B. (2017). *Exceptional teaching for disadvantaged schools.* Retrieved fromhttps://www.ceu.edu/sites/default/files/attachment/event/17155/invitation-exceptional-teaching-disadvantaged-schools-20jan2017.pdf.

Burton, M., Brown, K., & Johnson, A. (2013). Storylines about rural teachers in the united states: a narrative analysis of the literature. *Journal of Research in Rural Education, 28*(12), 1–18.

China's Ministry of Education (2007). *The guidelines for implementing Free Teacher Education Programs at the Ministry of Education affiliated normal universities (Trial).* May 4, Retrieved from . (in Chinese) http://www.gov.cn/zwgk/2007-05/14/content_614039.htm.

China's Ministry of Education (2011). *The guidelines for recruiting the graduates of Free Teacher Education Programs of the Ministry of Education affiliated normal universities (Trial).* May 18, Retrieved from . (in Chinese) http://www.gov.cn/gongbao/content/2010/content_1713709.htm.

Christidou, V. (2011). Interest, attitudes and images related to science: Combining students' voices with the voices of school science, teachers, and popular science. *The International Journal of Environmental and Science Education, 6*(2), 141–159.

Chudgar, A., Chandra, M., & Razzaque, A. (2014). Alternative forms of teacher hiring in developing countries and its implications: A review of literature. *Teaching and Teacher Education, 37*, 150–161.

Clark, J. S. (2017). Developing professional judgment: Preservice teachers drawing upon rurality to teach global issues in rural communities. *Ohio Social Studies Review, 54*(1), 2013.

Cochran-Smith, M., Davis, D., & Fries, K. (2004). Multicultural teacher education. In J. A. Banks, & C. A. M. Banks (Eds.). *Handbook of research on multicultural education* (pp. 931–975). (2nd ed.). San Francisco: Jossey-Bass.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (sixth ed.). New York: Routledge.
Collins, T. (1999). *Attracting and retaining teachers in rural areas.* Retrieved on November 1st, 2017 fromERIC Digesthttps://files.eric.ed.gov/fulltext/ED438152.pdf.
Cornbleth, C. (1984). Beyond hidden curriculum? *J. Curriculum Studies, 16*(1), 29–36.
Cuervo, H., & Acquaro, D. (2018). Exploring metropolitan university pre-service teacher motivations and barriers to teaching in rural schools. *Asia-Pacific Journal of Teacher Education,* 1–15.
Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist, 34*(3), 169–189.
Ejieh, M. U. (2005). Students' reasons for entering Nigerian primary teacher education and, their career plans. *Research in Education, 74*(1), 36–46.
Fields, A. (2004). *Curriculum-based motivation group: A five session motivational interviewing group intervention.* Vancouver, Washington: Hollifield Associates.
Finson, K. D. (2002). Drawing a scientist: What we do and do not know after fifty years of drawings. *School Science and Mathematics, 102*(7), 335–345.
Ginsburg, M. B., & Clift, R. T. (1990). *The hidden curriculum of preservice teacher education. Handbook of research on teacher education*450–465.
Glynn, S. M., Taasoobshirazi, G., & Brickman, P. (2007). Nonscience majors learning science: A theoretical model of motivation. *Journal of Research in Science Teaching, 44*(8), 1088–1107.
Hafferty, F. W., & Castellani, B. (2009). *The hidden curriculum: A theory of medical education. Handbook of the sociology of medical education.* Routledge29–49.
Han, J., & Yin, H. (2016). Teacher motivation: Definition, research development and implications for teachers. *Cogent Education, 3*(1), 1217819.
Handal, B., Watson, K., Petocz, P., & Maher, M. (2018). Choosing to teach in rural and remote schools: The zone of free movement. *Education Research and Perspectives, 45*, 1–32 (Online).
Hawley, T. S., & Crowe, A. R. (2016). Making their own path: Preservice teachers' development of purpose in social studies teacher education. *Theory and Research in Social Education, 44*(3), 416–447.
Heilig, J. V., & Jez, S. J. (2010). *Teach for America: A review of the evidence.* Retrieved on November 3rd 2017 fromhttp://nepc.colorado.edu/publication/teach-for-america.
Ingersoll, R., Merrill, L., & Stuckey, D. (2014). *Seven trends: The transformation of the teaching force, updated April 2014. CPRE Report (#RR-80)*Retrieved on November 3rd 2017 fromhttps://files.eric.ed.gov/fulltext/ED566879.pdf.
Janzen, M. D., & Cranston, J. (2016). Motivations and experiences of teachers in a northern Manitoba community. *Alberta Journal of Educational Research, 61*(2), 183.
Kiziltepe, Z. (2008). Motivation and demotivation of university teachers. *Teachers and Teaching, 14*, 515–530.
Kline, J., White, S., & Lock, G. (2013). The rural practicum: Preparing a quality teacher workforce for rural and regional Australia. *Journal of Research in Rural Education, 28*(3), 1–13 (Online).
Knoblauch, D., & Chase, M. A. (2015). Rural, suburban, and urban schools: The impact of school setting on the efficacy beliefs and attributions of student teachers. *Teaching and Teacher Education, 45*, 104–114.
Kubanyiova, M. (2009). *Possible selves in language teacher development. Motivation, language identity and the L2 self.* 314–332.
Lampert, J., Burnett, B. M., & Davie, S. (2012). Preparing high achieving English teachers to work in disadvantaged schools: 'I'll teach Shakespeare when I'm 60'. *English in Australia, 47*(3), 69–77.
Lampert, J., & Burnett, B. M. (2011). Exceptional teachers for disadvantaged schools. *Curriculum Leadership, 9*(17), 1–2.
Liao, W., & Yuan, R. (2017). Understand an emerging "failure" of an equality-oriented teacher policy in China: A job search perspective. *International Journal of Educational Research, 81*, 71–82.
Lopes, A., & Pereira, F. (2012). Everyday life and everyday learning: A pre-service teacher education curriculum can encourage personal dimensions of teacher identity. *European Journal of Teacher Education, 35*(1), 17–38.
Malmberg, L.-E. (2008). Student teachers' achievement goal orientations during teacher studies: Antecedents, correlates and outcomes. *Learning and Instruction, 18*(5), 438–452.
Martin, K., Rutherford, M. M., & Stauffer, M. H. (2013). The rural urban collaborative: Developing understandings of culture and teaching. *The Ohio Social Studies Review, 49*(1), 10–19.
McEwan, P. J. (1999). Recruitment of rural teachers in developing countries: An economic analysis. *Teaching and Teacher Education, 15*(8), 849–859.
Mpokosa, C., Ndaruhutse, S., McBride, C., Nock, S., & Penson, J. (2008). *Managing teachers: The centrality of teacher management to quality education. Lessons from developing countries.* London Reading: VSO International and CfBT.
Moran, A., Kilpatrick, R., Abbott, L., Dallat, J., & McClune, B. (2001). Training to teach: Motivating factors and implications for recruitment. *Evaluation and Research in Education, 15*(1), 17–32.
Phillips, S. P., & Clarke, M. (2012). More than an education: The hidden curriculum, professional attitudes and career choice. *Medical Education, 46*(9), 887–893.
Rabiee, F. (2004). Focus-group interview and data analysis. *The Proceedings of the Nutrition Society, 63*(4), 655–660.
Richardson, P. W., & Watt, H. M. (2006). Who chooses teaching and why? Profiling characteristics and motivations across three Austrilian universities. *Asia-Pacific Journal of Teacher Education, 34*(1), 27–56.
Rogers, R. W., & Mewborn, C. R. (1976). Fear appeals and attitude change: Effects of a threat's noxiousness, probability of occurrence, and the efficacy of coping responses. *Journal of Personality and Social Psychology, 34*(1), 54–61.
Roness, D., & Smith, K. (2010). Stability in motivation during teacher education. *Journal of Education for Teaching, 36*(2), 169–185.
Rots, I., Kelchtermans, G., & Aelterman, A. (2012). Learning (not) to become a teacher: A qualitative analysis of the job entrance issue. *Teaching and Teacher Education, 28*(1), 1–10.
Sharif, T., Hossan, C. G., & McMinn, M. (2014). Motivation and determination of intention to become teacher: A case of B. Ed. students in UAE. *International Journal of Business and Management, 9*(5), 60–73.
Sinclair, C. (2008). Initial and changing student teacher motivation and commitment to teaching. *Asia-Pacific Journal of Teacher Education, 36*(2), 79–104.
Skaalvik, E. M., & Skaalvik, S. (2011). Teacher job satisfaction and motivation to leave the teaching profession: Relations with school context, feeling of belonging, and emotional exhaustion. *Teaching and Teacher Education, 27*, 1029–1038.
Stinebrickner, T. R. (1998). An empirical investigation of teacher attrition. *Economics of Education Review, 17*(2), 127–136.
Tang, Y., He, W., Liu, L., & Li, Q. (2018). Beyond the paycheck: Chinese rural teacher well-being and the impact of professional learning and local community engagement. *Teachers and Teaching, 24*(7), 825–839.
Velthuis, C., Fisser, P., & Pieters, J. (2014). Teacher training and pre-service primary teachers' self-efficacy for science teaching. *Journal of Science Teacher Education, 25*(4), 445–464.
Wang, D., & Gao, M. (2013). Educational equality or social mobility: The value conflict between preservice teachers and the Free Teacher Education Program in China. *Teaching and Teacher Education, 32*, 66–74.
Watt, H. M. G., & Richardson, P. W. (2008). Motivations, perceptions, and aspirations concerning teaching as a career for different types of beginning teachers. *Learning and Instruction, 18*, 408–428.
Watt, H. M. G., & Richardson, P. W. (2012). An introduction to teaching motivations in different countries: Comparisons using the FIT-Choice scale. *Asia-Pacific Journal of Teacher Education, 40*(3), 185–197.
Williams, M., & Burden, R. L. (1997). *Psychology for language teachers: A social constructivist approach.* Cambridge: Cambridge Univesity Press.
Wright, V. H., & Wilson, E. K. (2009). Using technology in the social studies classroom: The journey of two teachers. *The Journal of Social Studies Research, 33*(2), 133–154.
Yuan, R., & Zhang, L. J. (2017). Exploring student teachers' motivation change in initial teacher education: A Chinese perspective. *Teaching and Teacher Education, 61*, 152.